NAVAL MEDICAL RESEARCH AND DEVELOPMENT

NEWS

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In this issue...

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Navy Medicine Admiral Receives Second Star, Heads New BUMED Department

By Shoshona Pilip-Florea, U.S. Navy Bureau of Medicine and Surgery Public Affairs

Rear Adm. Bruce A. Doll was promoted during a ceremony in Washington, October 12.

WASHINGTON - Rear Adm. Bruce A. Doll was promoted to rear admiral (upper half) during a ceremony at the Jefferson Memorial in Washington, D.C., October 12.

Doll's promotion comes in conjunction with his appointment as head of the new research and development code within the U.S. Navy Bureau of Medicine and Surgery (BUMED) earlier that month.

Vice Adm. Matthew L. Nathan, U.S. Navy surgeon general and chief, BUMED, presided over the ceremony where he lauded Doll's vast range of job experiences and the unique perspective he will bring to this position.

"Bruce is the type of leader we need more of in Navy Medicine," said Nathan. "He has served in every dynamic. He has served on ships. He has served overseas. And to each of these positions he brought his exceptional expertise in topics ranging from periodontics to regenerative medicine to molecular biology. I know what he will bring to his new role will be equally outstanding. I could not be more proud to promote him today and to have him as part of the Navy Medicine family."

During the ceremony, Doll thanked his family for the exceptional support they have provided throughout his career and said he is looking forward to the challenge of establishing a new code within BUMED.

"It's exciting to get to steer the ship first and chart the course," said Doll. "There are many challenges though, the first being the budgetary restraints in the current environment we operate in today."

The new code was developed as part of a larger realignment designed to improve the organization's responsiveness and effectiveness in keeping with Nathan's priorities of readiness, value and jointness for the Navy Medicine enterprise.

"Navy Medicine's mission is to support the forward-deployed force and ensure personnel readiness. Navy Medicine keeps the nation's naval forces medically ready to operate around the world and a large part of that comes from our tremendous research and development efforts like creating new vaccines or new aviation survival equipment," said Nathan. "By having stronger oversight of the R&D community and flag-level advocacy, we know we can bring more value to this process and also explore ways to work with our sister Services on joint research to reduce redundancies."

Doll echoed Nathan's statements

(Continued on page 5)

NMRC Commanding Officer's Message

Most of you have probably noticed that it is not "business as usual" this fiscal year. We've only barely cleared October and we have already faced "travel caps" (set at 35 percent below our FY10 travel), high-level conference approval requirements (currently at the Secretary of the Navy), Full Time Equivalent (FTE) employee caps, and of course, our new financial model, which is creating its own set of challenges. With more financial cuts looming and a planned Navy-wide financial audit, we could potentially see even more changes or restrictions in our business model.

We can't know all the challenges that are going to come our way because of the unpredictable and dynamic nature of current and future operating environments. What we do know is that our mission hasn't changed. We are still committed to support the warfighter and our partner nations by sustaining current research efforts and developing essential new projects with a commitment to research accountability and continued scientific excellence. To continue to meet this mission, we will likely have to make changes in some of the ways we operate. I am confident that we'll be able to do that. We have a talented and imaginative work force and we will all pull together to find ways to achieve our mission. There will be cuts and restrictions, but there will also be opportunities to shape the future of Navy Medicine research and development as we explore ways to strengthen our position within the Navy, our partnerships with our sister services, our collaborations with industry and academia, and our relationships with our host country partners.

NMRC Commanding Officer sends,
John W. Sanders III,
CAPT, MC, USN

NAMRU-6 Commanding Officer's Message

MED R&D contributes directly to the readiness of the warfighter. Undertakings such as vaccine development, enhancements to psychological resilience and physical performance, and strategies for recovery and rehabilitation from combat wounds are current examples that showcase MED R&D's span of capabilities and agility for adapting to relevant challenges. The impact is every bit as significant as direct patient care because our investigators and technicians get the job done.

MED R&D may be the best value in the Navy Medicine enterprise. Unlike the operational side of the Navy, researchers don't receive a check like a squadron, ship, or hospital to carry out our mission. Based on their individual reputations for conducting quality research and providing meaningful results, our investigators reach out to funding sponsors. Operating in a grant-based environment sometimes feels like living paycheck to paycheck, but on the positive side it forces us to be frugal and efficient in our spending.

The reputation and capabilities of our laboratories play into the sponsors' desire to affiliate with us to form sustained and enduring partnerships. MED R&D is a fee-for-service operation, and the sponsors have choices about who they obtain those research services from. Just as the United captain says at the end of each flight, "we appreciate your business and know you had a choice of other airlines," in MED R&D we apply the same business approach by being mindful that other institutions are competing for the same science dollars. Whether it is a government agency, NGO, university or company, the competition keeps us sharp; stimulates innovation; and draws bright, high-performing people to our laboratories. Those traits make our laboratories a great fit in the larger military culture because we are a subset of an organization made up of competitors and fighters. If we don't prevail we don't survive, and to prevail we have to be good at what we do.

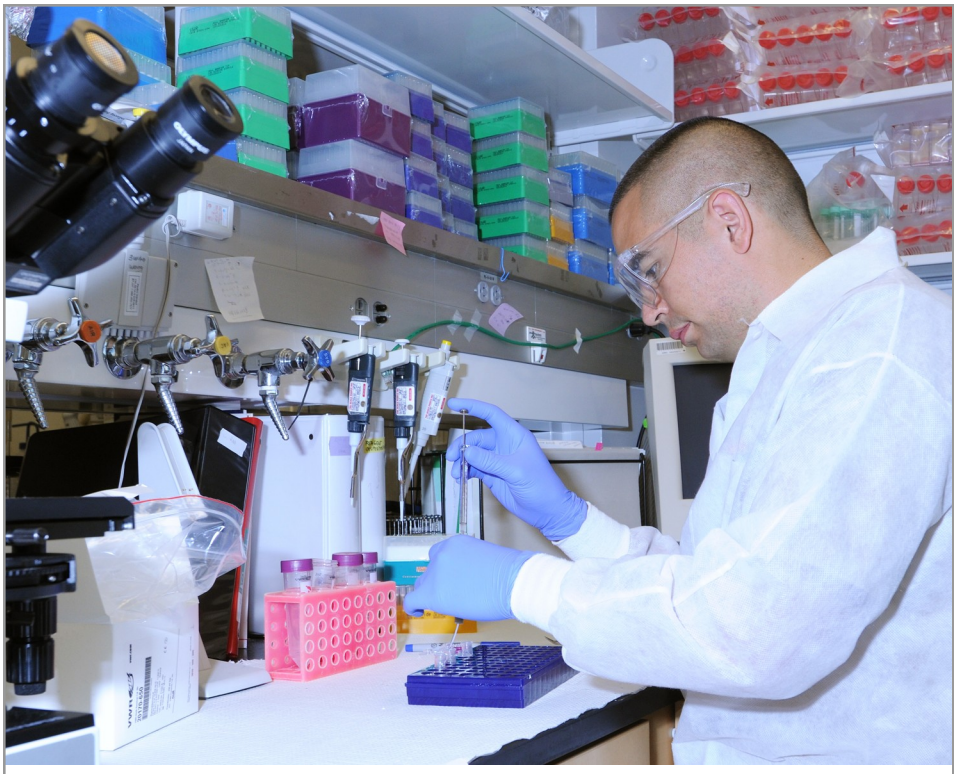
At NAMRU-6 we're proud to be part of the MED R&D team that provides so much value to Navy Medicine and to the Joint Warfighter. NAMRU-6; contributing to World Class Care from South America.

David B. Service
CAPT, MSC, USN
Commanding Officer, Naval Medical Research Unit No. 6 Peru

NMRC Researcher Is Awarded a Gates Foundation Grant

SILVER SPRING, Md. - A Naval Medical Research Center (NMRC) researcher was awarded a Bill & Melinda Gates Foundation Grand Challenges Exploration Opportunities Grant. Lt. Robert Gerbasi received a $100,000 grant with a potential follow-on grant of up to $1 million for his project that focuses on targeting the liver stage of malaria as a major component for a possible vaccine for deployed warfighters.

"A military conflict or humanitarian crisis can arise in a malaria endemic area of the world at any time," said Gerbasi. "If our warfighters are not protected from malaria they will be out of the fight pretty fast. We want to fight our adversary, not malaria and our adversary. I hope that over the long term this research identifies a new class of vaccine targets that can be used to protect service members and people who live in malaria endemic areas of the world."



Lt. Robert Gerbasi received a grant for his project that focuses on targeting the liver stages of malaria. Photo by Phil Collins.

The U.S. Military Malaria Vaccine Program (USMMVP) has aggressively pursued vaccine approaches to protect the warfighter from malaria. The Navy side of the USMMVP focuses on developing a vaccine that employs cell-mediated immunity by manipulating a specific cell type, the CD8T cell, to find and kill liver stage parasites.

Infected mosquitoes inject malaria parasites when they bite an individual. The parasites travel to the liver, invade liver cells, multiply and develop into thousands of parasites that burst out of the liver cells and into the bloodstream and infect red blood cells. During the liver stage, malaria presents pieces of itself, in the form of short peptides, on the surface of the liver cells.

"Our goal is to identify small pieces of malaria peptides," said Gerbasi. "Those peptides would serve as excellent vaccine candidates to train an individual's immune system to recognize and kill infected liver cells."

During the first six month of the project, Gerbasi and his team will work to identify thousands of peptides on the surface of infected liver cells. In the second phase of the project, they will identify the peptides that are immunogenic. In the final phase, Gerbasi will prepared the findings for presentation and publication.

"If things go well with the first Grand Challenges project, I will be placed on a short list of investigators eligible for a second Grand Challenges award worth $1 million," said Gerbasi. "I was pretty excited to have this proposal selected. The NMRC research program has an outstanding team of entomologists, microbiologists, biochemists and molecular biologists all working toward the goal of a vaccine. I am proud to be a member of the team."

"...I hope that over the long term this research identifies a new class of vaccine targets that can be used to protect service members and people who live in malaria endemic areas of the world."

The primary objective of the Navy malaria program is to develop a vaccine that kills the parasite during its first few days of development in the liver, before it breaks out into the blood. If this approach is successful, it will prevent the clinical manifestation of malaria, which occurs only in conjunction with blood-stage infection and not with the liver stage. Such a vaccine would benefit deployed military personnel as well as travelers and other populations. At the same time, the program is investigating vaccines that would target blood-stage infection to limit the severity of symptoms associated with this stage. Both liver and blood-stage vaccines, if deployed in endemic areas, could alleviate much of the suffering caused by this parasite in tropical countries.

Dayton Hosts Visit from Office of the Assistant Secretary of Defense

From NAMRU-Dayton Public Affairs

WRIGHT PATTERSON AFB - Dr. Patrick Mason of the Office of the Assistant Secretary of Defense for Research and Engineering (ASD (R&E)) toured the Naval Medical Research Unit – Dayton (NAMRU-Dayton) in August. As Director of the Human Performance, Training and BioSystems Directorate at ASD(R&E), Mason coordinates over $3 billion in research and engineering programs in the Department of Defense. He has purview over a broad range of research areas that directly relate to NAMRU-Dayton research efforts, including human performance, human-systems integration, training and environmental sciences.

During his tour through the Aeromedical and Environmental Health Effects Directorates, Mason was briefed by a number of scientists who explained the current projects and recent findings. In the Aeromedical Directorate, Dr. Jeffrey Phillips discussed hypoxia research, including new findings on the time course of recovery from hypoxic events. Phillips also discussed novel ways to detect hypoxia in its early stages, allowing aircrew to take corrective action before serious cognitive impairment develops.

Dr. Joseph Chandler (right) describes fatigue research during Dr. Mason's visit to NAMRU-Dayton.

Dr. Patrick Mason of the Office of the Assistant Secretary of Defense for Research and Engineering (center) is greeted by Dr. Henry Williams, Deputy Director, Aeromedical Directorate (right), and Dr. Michael Gargas, Director, Environmental Health Effects Directorate (left).

Lt. Stephen Eggan presented NAMRU-Dayton's spatial disorientation work, including his latest project using basic research to locate and better understand the brain structures and mechanisms that are responsible for how humans maintain, and in some cases lose, spatial orientation. His approach includes leading-edge techniques such as dense array electroencephalography and functional magnetic resonance imaging. As a neuroscientist himself, Mason was particularly interested in this effort.

While touring the Environmental Health Effects Directorate, Cmdr. Dan Hardt, Dr. Brian Wong and Mr. Arden James described research investigating submariner health and the development of the exposure systems used to evaluate submarine atmospheres. In addition, Mason was briefed by Mr. Jim Reboulet, who described NAMRU-Dayton's unique exposures systems for exposing laboratory animals to jet fuel gases, vapors and aerosols in combination with controlled sound exposure; this work is being conducted collaboratively with scientists from the Air Force. The tour ended in the *in vitro* laboratory, where Dr. Karen Mumy discussed the lab's expanding capabilities in cell culture approaches that are intended to someday replace *in vivo* animal testing.

Mason was pleased to see that NAMRU-Dayton researchers are working with USAF colleagues on many projects. He emphasized the importance of such teaming, and he encouraged the researchers to increase this constructive collaboration.

NAMRU-Dayton conducts research in the areas of acceleration effects, aviation medical standard and personnel selection, physiological and cognitive effects of altitude, vision research, pulmonary health effects, neurotoxicology and neurobehavior, reproductive health and systems biology.

PFGE Is Up and Running in Cambodia Thanks to Help from CDC

By Lt. Dustin Harrison, NAMRU-2 Public Affairs

Staff at the U.S. Naval Medical Research Unit No. 2 Detachment Phnom Penh, Cambodia complete pulsed-field gel electrophoresis training.

HAWAII - Molly Freeman, Ph.D., Chief, PulseNet PFGE Reference Unit, Enteric Diseases Laboratory Branch, conducted pulsed-field gel electrophoresis (PFGE) training at the U.S. Naval Medical Unit No. 2's (NAMRU-2) Detachment in Phnom Penh, Cambodia. The PFGE technique "cuts" whole bacterial genomes to generate a "pattern" much like a barcode or fingerprint, which is then compared to other bacterial isolates in the same genus. The resulting patterns are compared to one another and a computer program is then able to estimate their "relatedness," which is a very powerful tool in detecting bacterial outbreaks from normal sporadic bacterial infections.

"The Cambodian scientists were very enthusiastic about the training and have continued running additional gels to refine the technique," Freeman said. "The PFGE technique has taken a lot of heat in recent years as being archaic, with newer technologies like multi-locus sequence typing and multi-locus variable number tandem repeat analysis trying to supplant it. But the fact is, while it's a little technically demanding, it's perfect for low-resource settings to detect outbreaks and to study trends in pathogenic bacterial subtypes circulating in a region or country."

The training was conducted over a two-week period to allow the lab's Molecular Biology Section staff to get a lot of hands-on experience with the technique, which proved very useful as the lab team quickly assimilated the information and breezed through multiple gel runs.

"It's amazing how quickly our staff learns new techniques and can apply that knowledge almost instantly. This is a fantastic group of individuals to work with, and we really enjoyed having Molly here to help us get this up and running," said Lt. Mike Prouty, microbiologist.

In the coming months, the laboratory will begin running their collection of *Shigella flexneri* and *Vibrio cholerae* isolates to look at the characteristics of these strains circulating in this part of the world. NAMRU-2 Det PP will also participate in PulseNet Asia-Pacific, which collects and stores PFGE pattern information from the Asia-Pacific region that can be data-mined and used to build an accurate picture of the circulating strain types within the entire region.

Navy Medicine Admiral Receives Second Star, Heads New Dept.

(Continued from page 1)
and said that getting to work across the Services in the research and development community presents a unique challenge, but will potentially be the most rewarding opportunities he will encounter.

"We will get to leverage the expertise and skill sets of each medical community and really ensure we are investing in the right projects to meet the needs of our warfighters and beneficiaries," said Doll.

Prior to reporting to BUMED, Doll served as the Senior Health Care Executive, U.S. Navy Medical advisor, Allied Command Transformation (NATO). As a Navy Reservist, he has also held many influential and important roles in the civilian sector of medicine, including as the chief operating officer, Rutgers University/ Cleveland Clinic research consortium focusing on regenerative medicine for the wounded warrior.

Doll is a member of many professional societies and a diplomat of the American Board of Periodontology. He is also a grantee of the National Institutes of Health. He has received fellowships from Omicron Kappa Upsilon, the International and American College of Dentists.

Navy Medicine is a global health care network of 63,000 personnel who provide health care support to the U.S. Navy, Marine Corps, their families and veterans in high operational tempo environments, at expeditionary medical facilities, medical treatment facilities, hospitals, clinics, hospital ships and research units around the world.

NHRC Population-Based Surveillance Among U.S. Military Recruits

By Dr. Shan Putnam and Dr. Ramona McCaffrey, NHRC Enteric Disease Research Surveillance Program

SAN DIEGO - The Enteric Disease Surveillance Program (EDSP), part of the Naval Health Research Center (NHRC) Operational Infectious Diseases Department, is focused on describing the epidemiology of enteric diseases among at-risk U.S. military populations, including recruits and operational forces. The program establishes acute gastroenteritis (AGE) surveillance with the specific goals of quantifying disease burden and operational impact, developing a diagnostics platform, and evaluating therapeutic and prophylactic products to limit the impact of gastroenteritis on U.S. forces afloat and ashore.

Enteric diseases are the most commonly reported health care issues among troops; one of the most debilitating is AGE. AGE is the rapid onset of diarrheal disease with or without accompanying symptoms (nausea, vomiting, fever or abdominal pain). AGE is commonly reported among deployed military populations, and studies show that most cases are likely caused by norovirus (NoV), which causes approximately 90 percent of reported nonbacterial AGE outbreaks in Western countries. NoVs are highly contagious and are transmitted via ingestion of contaminated food and drink as well as person-to-person via aerosols.

EDSP's initial focus was to describe the etiology and epidemiology of AGE among military recruits at Marine Corps Recruit Depot (MCRD) San Diego, MCRD Parris Island, and Recruit Training Command Great Lakes. Surveillance was designed as clinic-based, where researchers enrolled, collected and conducted laboratory testing on specimens from recruits seeking medical care for AGE. Researchers also tested clinical specimens collected from personnel deployed on USNS COMFORT (T-AH20) during Operation Continuing Promise 2011 and specimens collected during a large AGE outbreak at the U.S. Air Force Academy in Colorado Springs, Colo., in 2011.

Through February 2012, EDSP enrolled 239 AGE cases. In 38 percent of the cases, an enteric pathogen was identified. NoV was the most common, present in 32 percent of the cases. Overall, a total of 16 Salmonella strains were isolated from study participants, 11 from MCRD San Diego and 5 from MCRD Parris Island. Of special note, from November to December 2011, EDSP, in collaboration with San Diego County Public Health and the California State Laboratory, identified and typed 10 Salmonella cases, defining a unique cluster of cases among recruits

(Continued on page 7)

NMRC Celebrates Hispanic Culture and Contributions to USA

SILVER SPRING, Md. - The month of October honors the contributions of Hispanic men and women to the United States of America. October 24, the Naval Medical Research Center (NMRC) held an event to observe Hispanic Heritage Month. Lt. Robert Gerbasi is the command diversity officer at NMRC. Gerbasi, along with his Walter Reed Army Institute of Research (WRAIR) counterparts, coordinated an entertaining and educational event topped off with refreshments with Hispanic influences. They honored Medal of Honor recipient Col. Alfred Rascon for his contributions to the U.S. Army.

The guest speaker was Cmdr. Guillermo Pimentel, the Deputy Director of the NMRC Biological Defense Research Directorate located at Fort Detrick, Md. He discussed his upbringing as a Hispanic man in Guanica, Puerto Rico and how it molded him to

(Continued on page 14)

A few brave Navy and Army officers learn the "Capoeira," a Brazilian martial art that combines elements of dance and music.

NSMRL Researchers Investigate Submarine Work/Rest Cycle

From NSMRL Public Affairs

GROTON, Conn. - Researchers at the Naval Submarine Medical Research Laboratory (NSMRL) have been investigating alternatives to the standard submarine 18-hour work/rest cycle in an attempt to promote physiologic alignment of the body's natural 24-hour rhythm to the submarine workday. The dim lighting on submarines, in conjunction with the standard rotating shift-work schedules, can lead to poor entrainment of the circadian system, the body's internal clock, which regulates the release of certain hormones to promote effective sleep and sustained vigilance.

The Los Angeles-class attack submarine USS Scranton (SSN 756). Photo by Mass Communication Specialist Seaman Apprentice Cameron Bramham.

Lt. Colin Young, principal investigator for the Enhanced Lighting Study, conducted the study onboard the USS SCRANTON (SSN 756) during a recent 46-day underway. The study used bulbs enriched with short-wavelength light, which stimulates specific receptors in the eye and has been demonstrated to improve alertness and increase entrainment of the human circadian system by other researchers.

Twenty-nine engine room watchstanders volunteered to participate in the study while completing their normal underway duties. The entire engine room was relamped initially with short wavelength enhanced experimental light bulbs and then relamped with standard submarine light bulbs. The ship employed a 24-hour based schedule that featured an eight hour long on-watch shift with a break, eight hours of protected sleep time, and one period of the day from noon until 8:00 PM where the entire ship's crew is awake to facilitate command-wide evolutions such as training and drills.

The volunteers were requested to (1) stand watch in the same watch-section for the entire six-week underway duration, (2) remain below decks for each of the two eleven-day phases of the protocol, (3) continuously wear a wristwatch that measured light exposure and activity levels, (4) answer multiple questionnaires, (5) complete palm pilot based psychomotor vigilance tests, and (6) provide urine and saliva samples for hormonal analysis.

Study results are being analyzed and will be published at a later date.

Multiple different skill sets were needed to plan and complete this protocol. Completion of this study would not have been possible without the efforts of USS SCRANTON Commanding Officer, Cmdr. Matthew Burton, the supporting research staff from NSMRL, and Lt. Benjamin Lehmann, Submarine Squadron 6 Undersea Medical Officer.

This Office of Naval Research funded project was approved by the Commander, Submarine Force Atlantic and technically reviewed by the Naval Nuclear Propulsion Program. NSMRL collaborated with Professor Mark Rea and Associate Professor Mariana Figuero from the Lighting Research Center of Rensselear Polytechnic Institute in Troy, N.Y. and Mr. Bill Biers of General Electric. These organizations provided valuable resources, expertise and experience that made this effort possible.

NHRC Population-Based Surveillance Among U.S. Military Recruits

(Continued from page 6)

stationed only at MCRD San Diego. These cases prompted the Naval Medical Center San Diego Preventive Medicine Department to conduct inspections, leading to modifications in berthing and kitchen areas to control further spread.

AGE significantly impacts military personnel, and NoV is a primary etiological agent. NoV is an important health threat to the Department of Defense, and it affects both deployed ground and shipboard populations and recruits.

NHRC also works closely with operational units by conducting medical modeling and simulation analysis, monitoring the effects of combat exposure on psychological health, managing career-span deployment health and readiness programs, improving warfighter performance and assisting in the implementation of military-specific HIV prevention programs around the world.

Navy Medicine's Cairo Research Lab Celebrates Navy Birthday

CAIRO - On October 15, The U.S. Naval Medical Research Unit No. 3 (NAMRU-3) celebrated the 237th birthday of the U.S. Navy with VIP visits, a program in front of the Research Science Building, and refreshments following the program.

Even though the U.S. Navy staff are witnessing tumultuous political times in Cairo, the command recognized the importance of honoring the U.S. Navy birthday. NAMRU-3 was honored to have Mr. Marc Sievers, the Deputy Chief of Mission, and Maj. Gen. Richard Clark, Chief of the Office of Military Cooperation, attend the celebration.

Clark said that the people at NAMRU-3 "go all out" by doing their work with passion.

The day's events began with the raising of the U.S. and Egyptian flags over the compound. It was the first time the flags were raised since the Egyptian Revolution began. Capt. Buhari Oyofo and Lt. Cheryl Rozanski led Sievers and Clark on a tour of the lab and then joined NAMRU-3 staff for the program.

As the guest speaker, Clark captivated everyone with a motivational speech, praising everyone he'd met and spoken with on his tour of the lab. He talked about people who "cop out and drop out and hold out", but said that the people he'd seen in action at NAMRU-3 were the kind of people who "go all out" by doing their work with passion.

Rozanski then read the Chief of Naval Operations' message on the occasion of the Navy Birthday, followed by the singing of *Anchors Aweigh* by NAMRU-3's newly promoted Chief, HMC Jaime Inda.

The formal program concluded with the cutting of a cake that had been baked and decorated by the talented chef, our Senior Enlisted Leader, HMC Laregen Valdez. Oyofo, the oldest sailor, cut the cake with the youngest sailor, Lt. Nick Dieckman.

Maj. Gen. Clark addresses NAMRU-3 staff. Photos by Rafi George.

Capt. Oyofo (right) and Lt. Dieckman (left), NAMRU-3's oldest and youngest sailors, cut the cake prepared by HMC Laregen Valdez.

NAMRU-2 Det PP Meets with U.S. Peace Corps Medical Officers

By Lt. Gavin Ford, MC, NAMRU-2 Detachment Phnom Penh

NAMRU-2 DET PHNOM PENH, Cambodia - U.S. Peace Corps medical officers met with researchers from the U.S. Naval Medical Research Unit No. 2 (NAMRU-2) Detachment Phnom Penh to identify locations in Cambodia where volunteers could participate in modernization and capacity building in the rural healthcare system.

Dr. Cedric Yoshimoto, Peace Corps regional medical officer, and Dr. Joanne Polka, Peace Corps medical officer, had recently returned from a trip touring some Cambodian regional hospitals and reported how far Cambodian health facilities have to go in delivering reliable, modern health care. It was an opportunity for NAMRU-2 to identify which provincial hospitals may be willing to partner in capacity-building initiatives.

"Our short-term vision is to place NAMRU-2 trained laboratory technicians in outlying provincial hospitals in Preah Vihear, Stung Treng, Rattanak Kiri, Mandul Kiri, and Svay Rieng, for example, to eventually establish independently functioning clinical microbiology laboratories," said Cmdr. Steven Newell, NAMRU-2 Det PP laboratory director. "These laboratories would have very basic capability in point-of-care clinical microbiology diagnostic techniques."

Newell went on to say these laboratories would be able to receive and process samples that are part of NAMRU-2 studies without a need for sample transport back to Phnom Penh, which is currently very lengthy and results in lower pathogen yields than would otherwise be expected. This would be a substantial improvement in efficiency as well as a significant leap forward in overall laboratory capacity in Cambodia.

The Peace Corps representatives commented that there is great potential in Cambodia for collaboration between NAMRU-2 and the Peace Corps by utilizing Peace Corps volunteers in the establishment of these labs.

Yoshimoto said, "Many Peace Corps volunteers have aspirations to pursue careers in the medical community. These individuals often have Bachelor's degrees in the sciences, so their interests and educational background would make them a strong resource as participants in these projects."

This will also help Peace Corps doctors be more informed about current infectious disease trends in-country so they are more informed in the care of their patients.

IDD Seminar: Applications of Phage Therapy in Military Medicine

SILVER SPRING, Md. - Dr. Biswajit Biswas, Ph.D., a phage team leader at the Naval Medical Research Center's (NMRC) Biological Defense Research Directorate (BDRD), located in Fort Detrick, Md., discussed the "Applications of Phage Therapy in Military Medicine" at the NMRC Infectious Disease Directorate's monthly seminar October 19. His topic centered on bacteriaphages, also known as phages, which are environmentally abundant, intracellular parasites that use bacteria to reproduce.

Shortly after the outbreak of World War II, the U.S. Army supported the work of Rene Dubos, a French-born American microbiologist, to investigate the efficacy of phage for the treatment of gram-negative infections with *Shigella dysenteriae.*

Dubos was able to rescue mice infected intracerebrally with *Shigella dysenteriae* by injecting anti-Shiga phages into the general circulation.

(Continued on page 10)

Dr. Biswajit Biswas of NMRC's Biological Defense Research Directorate discusses phage therapy in military medicine at NMRC's monthly research and development seminar.

Canadian Researchers Visit Dayton Navy Medicine Research Lab

From NAMRU-Dayton Public Affairs

WRIGHT PATTERSON AFB - The Naval Medical Research Unit-Dayton (NAMRU-Dayton) hosted seven scientific leaders representing Defense Research and Development Canada. Overview briefings were provided on the capabilities of the Canadian and U.S. laboratories, during which numerous topics of mutual interest and expertise were highlighted.

NAMRU-Dayton Commanding Officer, Capt. Doug Forcino, led the visitors on a tour of facilities, including the toxicology and aeromedical laboratories.

Researchers at the inhalation toxicology facilities highlighted recent research on the effects of combined jet fuel and noise exposure on hearing loss and provided a demonstration of NAMRU-Dayton's unique nose-only inhalation towers. The visitors also learned about the laboratory's robust capability to conduct human cell-line-based toxicology research.

Researchers in the aeromedical directorate highlighted ongoing research in the areas of hypoxia monitoring and mitigation, fatigue countermeasures, basic neural mechanisms of spatial orientation and motion sickness mitigation. They also demonstrated the Vertical Linear Accelerator, which supports vestibular and whole-body vibration research, and the new Disorientation Research Device, which is expected to play a defining role in the next generation of spatial disorientation research by the Department of Defense and our allies.

Numerous topics with potential for research collaboration were identified during the course of the visit, and discussions with NAMRU-Dayton's Canadian colleagues continue.

Mr. Roy Dory (right) explains the capabilities of the Disorientation Research Device to Canadian scientific leaders.

IDD Seminar: Applications of Phage Therapy in Military Medicine

(Continued from page 9)

However, shortly thereafter, the commercial availability and success of antibiotics largely led to the abandonment of phage research. The increased prevalence of multidrug-resistant bacterial pathogens today has reopened investigations into phages as a therapeutic agent.

Biswas' work on phages has included therapeutic, prophylactic and diagnostic uses, including development and testing of *B. anthracis* phages for treatment of anthrax in mice. Bacteriaphages are also being studied as vaccine delivery agents due to phages' ability to stimulate both arms of the immune system (humoral and cell mediated immunity). Lambda phage display vaccines produce immunogenic phage particles that display foreign antigen on the phage surface. Working with an influenza model, he has designed lambda phages to carry novel H5N1-specific antigens to stimulate the immune system. By having the phage express biotinylated peptides, Biswas is also finding novel ways to use phages to diagnostically test for the presence of specific bacteria such as anthrax. In addition, Biswas and BDRD are active collaborators with the NMRC Wound Infections Department. They are looking to investigate phages as a treatment for *Acinetobacter baumannii* infected wounds in a mouse model with the hopes it can be a useful therapeutic for infected blast wounds in the warfighter.

Dr. Biswas speaks about phage therapy in military medicine at the NMRC Infectious Diseases Directorate seminar.

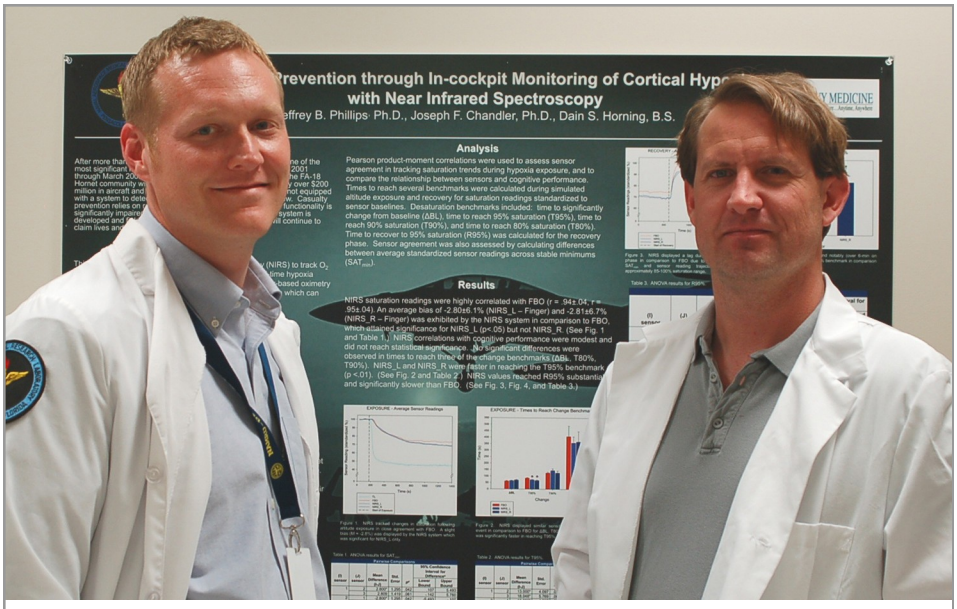
NAMRU-Dayton Researchers Receive SAFE Association Award

From NAMRU-Dayton Public Affairs

WRIGHT PATTERSON AFB - Two researchers from the Naval Medical Research Unit-Dayton (NAMRU-Dayton) received a safety award from the Wright Brothers Chapter of the SAFE Association. SAFE is an international professional organization dedicated to ensuring personal safety and protection in land, sea, air and space environments. The Wright Brothers Chapter recently hosted their 2012 awards ceremony in Dayton, Ohio.

John C. Hill, president of the Wright Brothers Chapter, presented Dr. Jeff Phillips and Mr. Dain Horning with the chapter's award for "2012 Outstanding Program Team, in recognition of outstanding contributions as part of the F-22 Physiological Support Team."

This award recognized the outstanding work of the joint Air Force-Navy team addressing emergent problems surrounding pilot life support systems in the F-22 Raptor. Since the summer of 2011, NAMRU-Dayton's hypoxia research team has been supporting USAF efforts to address oxygen problems in the F-22 while leveraging these efforts to address similar problems in the F/A-18.



Dr. Jeffrey Phillips (left) and Mr. Dain Horning (right) of NAMRU-Dayton.

The SAFE award is the latest of several recent awards and recognition Phillips, Horning and their USAF teammates have received for their pioneering work to understand and address this challenging problem. NAMRU-Dayton leadership has strongly supported these efforts through recent initiatives to expand hypoxia research facilities and staff, further positioning the laboratory as a leader among Department of Defense laboratories in addressing this dangerous threat to aviators.

NMRC's Military and Civilians Celebrate Navy's 237th Birthday

SILVER SPRING, Md. - The Naval Medical Research Center celebrated the U.S. Navy's 237th birthday October 12. Military, civilian employees and contractors gathered together to celebrate. Executive Officer Capt. Elizabeth Montcalm-Smith and Lt. Christina Farris, Viral and Rickettsial Diseases Department, ceremoniously cut the first slice of cake, a Navy tradition. The tradition, recognized annually at Navy commands worldwide, illustrates that regardless of rank all military men and women are part of the same team.

The U.S. Navy traces its origins to the Continental Navy, which the Continental Congress established October 13, 1775, by authorizing the procurement, outfitting, manning and dispatching of two armed vessels to cruise in search of munitions ships supplying the British army in America.

In 1972 Chief of Naval Operations (CNO) Admiral Elmo R. Zumwalt authorized recognition of October 13 as the Navy's birthday. The Navy birthday is intended as an internal activity for members of the active forces and reserves as well as retirees and their families. Since 1972 each CNO has encouraged a Navy-wide celebration of this occasion "to enhance a greater appreciation of our Navy heritage and to provide a positive influence toward pride and professionalism in the naval service."

Photo: Getting ready to cut the Navy 237th birthday cake

Kids Bugged Out!

Provided by NAMRU-2 Public Affairs

HAWAII - Sailors from Naval Medical Research Unit No. 2 (NAMRU-2) Pacific and Navy Environmental and Preventive Medicine Unit No. 6 (NEPMU-6) teamed up to provide an early introduction to entomology for the students of Navy Hale Keiki School on Oahu, October 18 and 19.

The class was designed to introduce the pre-kindergarten through fourth-grade students to the wonderful world of entomology, including how to tell the difference between spiders and insects (hint: count the legs!), how spider webs are used, and many other entomology fun facts.

The sailors teaching the class included one Navy Entomologist and five Hospital Corpsmen. The team visited four classes at the Navy Hale Keiki School during the two days.

Students got hands-on time with microscopes, examined specimens native to Hawaii, and learned about how some insects can be both harmful and very beneficial.

Lt. Ian Sutherland provides a show-and-tell to students from the Navy Hale Keiki School on Oahu.

"Force health protection is always our number one job, but I'm very grateful when we can give back to the community and have fun with the kids," said NAMRU-2 entomologist Lt. Ian Sutherland.

The team also showed the students equipment that is used to capture mosquitoes, portable digital imaging systems, and other scientific gear. Students were encouraged to understand how such small creatures can have huge medical and economic impacts both at home and abroad.

"I love seeing their faces when we show them live insects. They are usually a little grossed out, but then quickly start to ask excellent questions," said NEPMU-6's HM1 Michael Williams.

Future entomologists? Students from the Navy Hale Keiki School examine some bugs provided by NAMRU-2.

HM1 Milton Lewis explains the difference between spiders and insects.

SUBASE Showcases Science and Research at Annual 4-H Event

By MCSN Gabriel Bevan

GROTON, Conn. - Sailors from the Naval Submarine Medical Research Laboratory (NSMRL) and the Naval Submarine Support Facility (NSSF) Dive Locker at Naval Submarine Base New London joined with other local entities in stoking the flames of education during the annual 4-H Science Fair at the Submarine Force Library and Museum, October 17.

"We want to show our community and the public the strides we are making to support the warfighting mission of the Navy."

With participants from the Mystic Aquarium, Groton Utilities, Operation Military Kids, the U.S. Coast Guard Academy, and the Navy, the fair showcased everything from recycling and robotics to audiology studies and light research on board naval vessels.

Lt. Katherine Couturier, a medical research officer at NSMRL, explained to attendees the studies in light research and the effects that light has on service members who are deployed or afloat. The lab's studies have revealed that to ensure the energy and pep of military members who are exposed to great amounts of artificial light, fluorescent or artificial light with a blue hue helps suppress the body's chemicals that make a person feel jet-lagged or lackadaisical.

A Navy diver assigned to NSMRL helps a child try on a diver's breathing apparatus at the 4-H science fair.

Lt. Katherine Couturier, a medical research officer at the Naval Submarine Medical Research Laboratory, speaks about studies in light research during the annual 4-H event at the Submarine Force Library and Museum. Photos by MCSN Gabriel Bevan.

"We want to show our community and the public the strides we are making to support the warfighting mission of the Navy," said Couturier.

Other exhibits set up inside the main rooms of the museum offered students and the student-minded opportunities to learn about circuits, the importance of recycling, and even the water cycle process.

Navy divers from NSMRL set up hands-on displays where those in attendance could try on a Navy diver's breathing apparatus. Navy Diver 2nd Class Cody Blackburn, who is assigned to NSMRL, said that their display was very popular.

"We had a lot of people who were interested in what we do, and they really enjoyed trying on the diver's mask," said Blackburn.

Helping to end the fair on a high note, the University of Connecticut, originally founded as the state's agricultural school, offered fairgoers a nod to the school's dairy roots: a delicious ice cream tasting bar.

Overall, the participants as well as the attendees enjoyed the fair experience.

"It's important for the Navy to participate in events such as this," said Couturier. "A lot of people don't realize how important the role of scientific research is in the service and it's good for taxpayers to see that side of the Navy."

4-H in the United States is a youth organization administered by the National Institute of Food and Agriculture under the U.S. Department of Agriculture. 4-H focuses on citizenship, healthy living, and science, engineering, and technology programs.

NMRC Servicemembers Participate in 2012 Wilderness Challenge

SILVER SPRING, Md. - Each year, some of our athletically gifted servicemembers participate in the Wilderness Challenge, a grueling two-day event covering 52 total miles. The 2012 challenge took place in Fayetteville, W. Va., October 4-6. This year NMRC sent two teams, identified as Surf-N-Turf One and Two.

The first day consisted of an eight-kilometer mountain run followed by a fourteen-mile whitewater raft race. The teams were doing so well that Surf-N-Turf One decided to flip their raft on the last rapid so they could do a bit of swimming and enjoy the brisk river water to its fullest.

Day two started bright and early with a twelve-mile mountain bike ride through the mud. There was more than enough mud to go around for everyone…and for those who have never been on a mountain bike before, it was trial-by-fire. Immediately following the bike ride was a seven-mile duckie race (imagine a two-person whitewater raft) where the teams decided that, despite the cold weather, they wanted to go swimming again.

After a quick thaw and change into dry clothes, the teams wrapped up the day with a not-so-easy fourteen-mile hike. Surf-N-Turf Two powered through the course, despite the mud, with enough energy to *run* part of the hike and the team finished strong. Surf-N-Turf One was not so lucky and met a big angry swarm of yellow jackets on the trail, leaving one team member with several stings and everyone else trailblazing through thorny bushes to avoid the swarm. Overall, it was a great, action-packed weekend filled with camaraderie and fun.

From left: U.S. Coast Guard Capt. (ret.) Mike Cosenza and U.S. Navy officers Lt. Brian Pike, Lt. Danett Bishop, Lt. Rebecca Pavlicek, Lt. Michelle Lane, Lt. Robert Gerbasi, and Cmdr. Ramiro Gutierrez.

Getting ready for the mountain bike ride.

NMRC Celebrates Hispanic Culture and Contributions to USA

(Continued from page 6)

be a people's person. He spoke about his culture as one that enjoys being surrounded by family, friends and people. When he joined the U.S. Navy, he understood that language could be a barrier, but he also saw it as a plus. Joining the Navy became an adventure for him instead of a job, and his interactions with other cultures encouraged him to be a flexible and humble person.

After his presentation, the event ended with an invitation to the audience to learn the "Capoeira," a Brazilian martial art that combines elements of dance and music. It was created mainly by descendants of African slaves with Brazilian native influences and is known for its quick and complex moves using power, speed and leverage for leg sweeps. A few officers were brave enough to participate and become a part of the dance.

Greetings from the NMRC Ombudsman!

November 11th is Veteran's Day. Therefore, it is fitting that November also marks Warrior Care Month, a time to recognize wounded warriors as well as their caregivers. The theme this year is "Success through Transition," which recognizes the gains that wounded warriors and their families make every day in overcoming their illnesses and injuries. If you have questions about wounded warrior assistance for yourself or a loved one, the Navy Wounded Warrior call center is available 24 hours a day at 855-NAVY-WWP (855-628-9997).

Speaking of our Veterans, if you are returning from service and looking for a job in the National Capital Region, the U.S. Chamber of Commerce is hosting a **"Hiring Our Heroes" job fair** December 5. The job fair, sponsored by Capital One and the Military Bowl, will be held at Washington Nationals Park, 1500 South Capitol Street, SE, Washington, D.C. 20003 from 9:00 a.m. to noon. The event is FREE, and specific to veteran and military spouse job seekers! If you are in the job market and interested in learning more about the fair, you can register at the following website: http://www.uschamber.com/hiringourheroes/washington-dc-0. Alternatively, you may contact Ms. Noreen O'Neill at noneill@uschamber.com or 202-525-9418 or Kathryn Poynton at kpoynton@uschamber.com or 202-463-5807. There are numerous "Hiring Our Heroes" job fairs held monthly across the country. If you can't make the December 5th job fair in Washington, check out the website for alternative dates and locations.

November 22nd we celebrate Thanksgiving and with it the beginning of the holiday season. Although joyous, the holidays can also bring about financial stresses. With this in mind, below are tips about budgeting for the holiday season, presented as Part I of a two-part series. Part II of the series will be included in the December newsletter.

Holiday spending typically falls into one of four categories: gifts, entertaining, travel and decorating. It is never too soon to set a holiday budget with these expenses in mind. First, make a gift list, including EVERYONE for whom you'd like to buy gifts (e.g., teachers, coworkers, mail carrier, etc). Set a price limit on each gift and stick to it! Also consider inexpensive alternative gifts, such as cards, handmade items or baked goods.

Next, consider you entertainment budget. Even if you aren't having a party, providing snacks for neighbors or friends who drop by and serving the holiday meal can be expensive. Consider inviting friends and neighbors over for a cookie swap rather than baking batches to give away. Or ask family members to contribute a dish to your holiday meal instead of supplying all the food yourself. Similarly, estimate how much you'll spend on holiday decorations. This is often an easy area to cut back on. Think about what you did last year and determine whether you can reuse any decorations. Finally, travel can be one of the most costly expenses during the holiday season. If you'll be traveling during the holidays, even if it's by car, be sure to include these costs in your budget. I'll give more budgeting ideas on travel in the December newsletter.

Add up the estimates of all four expenses. If the total amount is more than you can afford, see where you can cut back. Ideally you'll have done this early enough in the year so you can slowly set aside money to cover your holiday expenses or shop for reasonably priced gifts throughout the year. But if you haven't, you can look for even more ways to trim your holiday budget while cutting back your regular expenses and putting money away for the holidays. Once you've reached a reasonable budget limit, commit to it!

Check out the websites below for additional budgeting tips: consumer credit counseling services, http://nfcc.org/, and money management, http://www.militaryonesource.mil/.

Of course, as we celebrate the holiday season, it is important to take a moment to remember those serving overseas who aren't able to be with their families this year. Look for opportunities to make this holiday season a little easier on those families sacrificing the most, maybe send a care package or lend a helping hand to a military family whose loved one is deployed. You'd be surprised how a small gesture can make a big difference!

As always, if you are in search of other resources or assistance, please don't hesitate to contact me. My email address is NMRC.Ombudsman@gmail.com

Have a Fine Navy Day!
Alexandra Mora
NMRC Ombudsman